at the given angles; the angles corresponding to any indices, or *vice versâ*, are read off directly within the limits of the scale. In the second method a double diagram is employed, of which one-half is a new form of the moriogram, and the other is a representation of angles the cotangent of which is the difference of the cotangents of the given angles; the method is general and unrestricted in its application.—Dr. J. **Drugman**: The Goldschmidt apparatus for cutting models of crystals. The mechanism was described and the method of using it explained.—Prof. H. L. **Bowman**: A nodule of iron pyrites. The octahedral shape and the striations on the faces truncating the coigns of the tiny crystals point to their being pyrites and not marcasite, as usually stated.

PARIS.

Academy of Sciences, January 20.—M. F. Guyon in the chair.—A. **Lacroix**: The mineralogical and chemical constitution of the volcanic lavas of the centre of Madagascar. Analyses of twenty-seven typical rocks are given. The materials derived from the two volcanic centres are analogous but not identical.—Pierre **Duhem**: The adiabatic stability of equilibrium.—Paul **Sabatier** and M. **Murat**: Preparation of the three cymenes and the three menthanes. The ortho-, meta-, and para-dimethylcresylcarbinols were prepared by three different methods, these dehydrated by passing over thoria at 350° C., and the cresyl-propenes, $CH_3.C_6H_4.C(CH_3)=CH$, reduced with hydrogen in presence of nickel to the three cymenes, $CH_3.C_6H_4.CH(CH_3)_2$, and ultimately to the corresponding menthanes, $CH_3.C_6H_{10}.CH(CH_3)_2$. The physical properties of all these compounds are given.—Paul **Richer**: The identification of the supposed skull of Descartes by its comparison with portraits. The skull preserved at the museum corresponds very closely with the portrait of Descartes by Franz Hals.—Henri **Chrétien**: The general magnetic field of the sun.—G. **Fayet**: The next return of the Finlay comet; disturbance of the orbit due to the action of Jupiter. An approximate calculation of the orbit after passage of the comet within the sphere of attraction of Jupiter. In its changed position the conditions of visibility will be very unfavourable.—Georges **Giraud**: Certain functional equations and the permutable transformations.—M. **Nörlund**: The problem of Riemann in the theory of equations of finite differences.—Louis **Bachelier**: Semi-uniform probabilities.—Et. **Delassus**: The various forms of Dalembert's principle, and the general equations of motion of systems submitted to linkages of any order.—M. **Mesnager**: A paradox of uniformly loaded rectangular plates.—E. **Fichot**: The production of static tides of the second kind in an ocean obeying any law of depth.—Vasilesco **Karpen**: The flight of birds without motion of the wings.—Émile **Borel**: The theory of relativity and kinematics.—C. **Dauzere**: Isolated cellular vortices.—J. **Guyot**: Differences of contact potential between a metal and electrolytic solutions.—E. J. **Brunswick**: Predetermination of the characteristics of continuous-current dynamos.—A. **Leduc**: Latent heats of evaporation and maximum pressures. An application of the Clapeyron formula to the calculation of latent heats, the specific volume of the saturated vapour being calculated by methods previously described by the author. Figures are given for water, ether, and benzene; the deviations from the experimental results are considerable.—E. **Briner** and M. **Boubnoff**: Chemical reactions in compressed gases. Study of the decomposition of nitric oxide. The decomposition of nitric acid is accelerated by pressure. The products of the reaction at 300° under high pressure include N_2, N_2O, N_2O_3, and NO_2.—Victor **Henri** and René **Wurmser**: The law of elementary photochemical absorption. The law is enunciated that the photochemical susceptibility of a body depends on that part of the absorption spectrum which corresponds to the same molecular groupings as those on which the reaction is produced.—Daniel **Berthelot** and Henry **Gaudechon**: Action of the middle and extreme ultraviolet rays on ethyl aldehyde: acidification, polymerisation, resinification. In the absence of oxygen the ultra-violet rays cause a simultaneous oxidation and reduction. The production of the polymers, metaldehyde and paraldehyde, and some aldehyde resin was also proved.—J. **Bougault**: Phenyl-α-oxycrotonic acid.—E. E. **Blaise** and E. **Carriere**: Succinic acid aldehyde. An attempt to clear up some discrepancies between the work of Carriere and that of Harries on the polymers of the acid aldehyde of succinic acid.—A. **Mailhe**: The nitro-derivatives of the oxides of orthocresyl and orthocresylene.—M. **Trabut**: The infectious chlorosis of the Citrus. This is transmitted by grafts, but numerous attempts to find a bacillus to account for the disease have proved fruitless.—M. **Chantemesse**: Preventive vaccination against typhoid fever in the navy. A comparison between vaccinated and unvaccinated persons, subjected to the same environment, shows that about 1 per cent. of the unvaccinated contracted typhoid fever, whilst not a single case occurred amongst the vaccinated.—M. **Rappin**: Antituberculous vaccination in the guinea-pig.—Raphael **Dubois**: Anæsthesia by the digestive canal. Anæsthesia caused by the rectal injection of chloroform ought to be rejected.—M. **Pezard**: Measurement of the reflex excitability of the spinal marrow and its variations under the influence of injections of solutions of calcium chloride.—Etienne **Rabaud**: The cryptocecidia of *Balanius nucum*, and the biological signification of galls.—A. **Labat**: The presence of bromine in the normal state in human organs. Bromine is normally present in the thyroid gland and in the urine.—Charles **Lepierre**: The non-specific action of zinc as a biological catalyser in the culture of *Aspergillus niger*. Its replacement by other elements. Cadmium has precisely the same influence as zinc in the growth of this mould.—Gabriel **Bertrand** and M. and Mme. **Rosenblatt**: The activity of Koji sucrase in presence of various acids.—R. **Fosse**: The formation of urea by two moulds. *Aspergillus niger* grown on a modified Raulin solution containing ammonium nitrate contains urea in its cells; *Penicillium glaucum* behaves similarly.—H. **Bierry**: The diastatic hydrolysis of glucosides and galactosides.

BOOKS RECEIVED.

Scottish National Antarctic Expedition. Report on the Scientific Results of the Voyage of s.y. *Scotia* during the Years 1902–3–4, under the Leadership of Dr. W. S. Bruce. Vol vi., Zoology. Parts i. to xi., Invertebrates. By Dr. C. Vaney and others. Pp. viii + 353 + plates. (Edinburgh: The Scottish Oceanographical Laboratory; Oliver and Boyd.) 30*s*.

A First Book of Experimental Science. Arranged By W. A. Whitton. Pp. vii + 137. (London: Macmillan and Co., Ltd.) 1*s*. 6*d*.

Das meteorologisch-magnetische Observatorium bei Potsdam. Pp. 81 + plate. (Berlin: Behrend and Co.) 3 marks.

Terminologie der Entwicklungsmechanik der Tiere und Pflanzen. By Profs. C. Conrens, A. Fischel, and E. Kuster. Edited by Prof. W. Roux. Pp. xii + 465. (Leipzig: W. Engelmann.) 10 marks.

Royal Society of London. Catalogue of Scientific

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Papers, 1800–1900. Subject Index. Vol iii., Physics. Part i., Generalities, Heat, Light, Sound. Pp. c+500+vii. (Cambridge University Press.) 18*s.* net.

Geological Literature added to the Geological Society's Library during the Year ended December 31, 1911. Pp. 164. (London: Geological Society.) 2*s.*

The Positive Evolution of Religion: its Moral and Social Reaction. By F. Harrison. Pp. xx+267. (London: W. Heinemann.) 21*s.* net.

Researches in Colour Vision and the Trichromatic Theory. By Sir W. de W. Abney. Pp. xi+418+v plates. (London: Longmans and Co.) 21*s.* net.

Egyptian Government. Almanac for the Year 1913. Pp. vii+212. (Cairo: Government Press.) P.T.5

The Gas, Petrol and Oil Engine. Vol. ii., The Gas, Petrol and Oil Engine in Practice. New and Revised Edition. By Dr. D. Clark and G. A. Burls. Pp. viii+838. (London: Longmans and Co.) 25*s.* net.

Year Book of the Indian Guild of Science and Technology, 1912. Pp. 193. (Letchworth: The Letchworth Printers.)

DIARY OF SOCIETIES.

THURSDAY, January 30.

Royal Society, at 4.30.—The Formation of Usually Convergent Fourier Series: Prof. W. H. Young.—The General Theory of Elastic Stability: R. V. Southwell.—A Spectro-photometric Comparison of the Emissivity of Solid and Liquid Copper and of Liquid Silver at High Temperatures with that of a Full Radiator: C. M. Stubbs.—A New Analytical Expression for the Representation of the Components of Diurnal Variation of Terrestial Magnetism: G. W. Walker.—An Investigation into the Magnetic Behaviour of Iron and some other Metals under the Oscillatory Discharge from a Condenser: Prof. E. W. Marchant.—The Spontaneous Crystallisation and the Melting and Freezing-point Curves of two Substances which form mixed Crystals and the Freezing Point Curve of which exhibits a Transition Point. Mixtures of p. Bromonitrobenzene and p. Chloronitrobenzene: Florence Isaac.

Royal Institution, at 3.—Recent Research on the Gas Engine: Prof. B. Hopkinson.

Concrete Institute, at 7.30.—The Settlement of Solids in Water and its Bearing on Concrete Work: Dr. J. S. Owens.

Society of Dyers and Colourists, at 8.—The Possibilities of a Standard Light and Colour Unit: J. W. Lovibond.—A Simple Method for Detecting Silk, Cotton and Wool Fibres in Admixture in Textiles: W. P. Dreaper.

FRIDAY, January 31.

Royal Institution, at 9.—The Poetry and Philosophy of George Meredith: G. M. Trevelyan.

MONDAY, February 3.

Society of Engineers, at 7.30.—The Bus *v.* Tram Controversy, and other Aspects of the London Traffic Problem: Wm. Yorath Lewis.

Royal Society of Arts, at 8.—Liquid Fuel: Prof. V. B. Lewes.

Aristotelian Society, at 8.

Society of Chemical Industry, at 8.—The Behaviour of Paint under the Conditions of Practice with special reference to the Aspersion cast upon Lead Paints: H. E. Armstrong and C. A. Klein.—The Technical Production of Ethane: C. Sprent.—The Feeding Value of the Horse Chestnut: S. J. M. Auld.

Institution of Civil Engineers, at 8.—Canals and Canalised Rivers: J. A. Saner.

Victoria Institute, at 4.30.—Vision, in Sacred and other History: Rev J. H. Skrine.

TUESDAY, February 4.

Royal Institution, at 3.—The Heredity of Sex and some Cognate Problems: Prof. W. Bateson.

Rontgen Society, at 8.15.—The Construction of Induction Coils: R. S. Wright.—A Simple Method for Inserting Radium into Lengths of Sterile Rubber Tubes: C. E. S. Phillips.

Zoological Society, at 8.30—Contributions to the Anatomy and Systematic Arrangement of the Cestoidea. VIII. Some Species of Ichthyotænia and Ophidotænia from Ophidia: Dr. F. E. Beddard.—Report on the Deaths which occurred in the Zoological Gardens during 1912: H. G. Plimmer.—The Anterior Ambulacrum of *Echinocardium cordatum*, Penn., and the Origin of Compound Plates in Echinoids: H. L. Hawkins.—Plankton from Christmas Island, Indian Ocean. II. Copepoda of the Genera Oithona and Paroithona: G. P. Farran.

Royal Anthropological Institute, at 8.15.—Cave Exploration in Gibralter in September, 1912: Dr. W. L. H. Duckworth.

Institution of Civil Engineers, at 8.—*Further Discussion:* The Canton-Kowloon Railway (Chinese Section): F. Grove and B. T. B. Boothby.—The Canton-Kowloon Railway (British Section): G. W. Eves. *Probable Paper:* The Erection of the Boucanne River Viaduct, Canada: P. L. Pratley.

WEDNESDAY, February 5.

Society of Public Analysts, at 8.—Antipyrine in Toxicological Analysis: G. D. Lander and H. W. Winter.—The Accurate Determination of Carbon Dioxide in Carbonates: F. S. Sinnatt.—A New Method for the Volumetric Estimation of Chromium, Vanadium and Iron in Admixture: F. W. Atack.—Note on Hardened Oils: A. W. Knapp.

Royal Society of Arts, at 8.—The Economic and Hygienic Value of Good Illumination: Leon Gaster.

Geological Society, at 8.—Two Deep Borings at Calvert Station (North Buckinghamshire), and on the Palæozoic Floor North of the Thames: Dr. A. M. Davies and J. Pringle.—The Skeleton of *Ornithodesmus latidens* from the Wealden Shales of Brightstone Bay (Isle of Wight): R. W. Hooley.

Entomological Society, at 8.

THURSDAY, February 6.

Royal Society, at 4.30.—*Probable Papers:* The Influence of the Resilience of the Arterial Wall on Blood Pressure and on the Pulse Curve: S. R. Wells and L. Hill.—The Occurrence of a Ganglion in the Human Temporal Bone not hitherto described: A. A. Gray.—The Action of Adrenin on Veins: J. A. Gunn and F. B. Chavasse.—A Preliminary Report on the Treatment of Human Trypanosomiasis and Yaws, with Metallic Antimony: Capt. H. S. Ranken.—Further Researches on the Extrusion of Granules by Trypanosomes and on their Further Development. (With a Note on Methods by H. G. Plimmer): Major W. B. Fry and Capt. H. S. Ranken.

Royal Institution, at 3.—Recent Research on the Gas Engine: Prof. B. Hopkinson.

Linnean Society, at 8.—Crosses of a Wild Pea with Cultivated Types: A. W. Sutton.—*Rheoxylon africanum*, a New Medullosean Stem: N. Bancroft.—Revision of the Linnean Types of Palæarctic Rhopalocera: Dr. R. Verity.

FRIDAY, February 7.

Royal Institution, at 9.—Life in the Great Oceans: Sir John Murray, K.C.B.

SATURDAY, February 8.

Royal Institution, at 3.—The Properties and Constitution of the Atom: Sir J. J. Thomson, O.M.

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